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Amendment and Response

Applicant: Mark A. Smith et al.

Serial No.: 09/839,385

Filed: April 20, 2001

Docket No.: 10001074-1

Title: INK CONTAINER CONFIGURED TO ESTABLISH RELIABLE FLUIDIC CONNECTION TO A RECEIVING STATION

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cont.
print media 22. The printer portion 18 selectively activates the printhead 16 to deposit ink on print media 22 to thereby accomplish printing.

Please replace the paragraph beginning at page 7, line 6, with the following rewritten paragraph:

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The scanning carriage portion 20 shown in FIG. 3 is shown fluidically coupled to a single printhead 16 for simplicity. Each of the replaceable ink containers 12 includes a latch 30 for securing the replaceable ink container 12 to the receiving station 14. The receiving station 14 in the preferred embodiment includes a set of keys 32 that interact with corresponding keying features 84 on the trailing end 82 of the replaceable ink container 12 (see FIG. 6). The keying features 10 on the replaceable ink container 12 interact with the keys 32 on the receiving station 14 to ensure that the replaceable ink container 12 is compatible with the receiving station 14.

Please replace the paragraph beginning at page 7, line 23, with the following rewritten paragraph:

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In the preferred embodiment, the reservoir 34 has a capillary storage member 90 (FIGS. 8-9) disposed therein. The capillary storage member 90 is a porous member having sufficient capillarity to retain ink to prevent ink leakage from the reservoir 34 during insertion and removal of the ink container 12 from the printing system 10. This capillary force is sufficiently great to prevent ink leakage from the ink reservoir 34 over a wide variety of environmental conditions such as temperature and pressure changes. In addition, the capillary of the capillary member is sufficient to retain ink within the ink reservoir 34 for all orientations of the ink reservoir as well as a reasonable amount of shock and vibration the ink container may experience during normal handling. The preferred capillary storage member is a network of heat bonded polymer fibers described in US Patent Application entitle "Ink Reservoir for an Inkjet Printer" attorney docket 10991407 filed on October 29, 1999, serial number 09/430,400, assigned to the assignee of the present invention and incorporated herein by reference. Other types of capillary material could alternatively be employed, such as foam.

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Please replace the paragraph beginning at page 9, line 15, with the following rewritten paragraph:

a5 FIG. 5 is a front perspective view of the receiving station 14 shown in isolation. The receiving station 14 shown in FIG. 5 includes a monochrome bay 56 for receiving an ink container 12 containing a single ink color and a tri-color bay 58 for receiving an ink container having three separate ink colors contained therein. In this preferred embodiment, the monochrome bay 56 receives a replaceable ink container 12 containing black ink, and the tri-color bay receives a replaceable ink container 12 containing cyan, magenta, and yellow inks, each partitioned into a separate reservoir within the ink container 12. The receiving station 14 as well as the replaceable ink container 12 can have other arrangements of bays 56 and 58 for receiving ink containers containing different numbers of distinct inks contained therein. In addition, the number of receiving bays 56 and 58 for the receiving station 14 can be fewer or greater than two. For example, a receiving station 14 can have four separate bays for receiving four separate monochrome ink containers 12 with each ink container containing a separate ink color to accomplish four-color printing.

Please replace the paragraph beginning at page 9, line 28, with the following rewritten paragraph:

a6 Each bay 56 and 58 of the receiving station 14 includes an aperture 60 in the bottom wall 68 for receiving each of the upright fluid interconnects 36 that extend there through. The fluid interconnect 36 is a fluid inlet for ink to exit a corresponding fluid outlet associated with the ink container 12. An electrical interconnect 62 is also included on the back wall 66 in each receiving bay 56 and 58. The electrical interconnect 62 includes a plurality of electrical contacts 64. In the preferred embodiment, the electrical contacts 64 are an arrangement of four spring-loaded electrical contacts that engage a plurality of electrical contacts 78 of the ink container 12 with proper installation of the replaceable ink container 12 into the corresponding bay of the receiving station 14.

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Please replace the paragraph beginning at page 10, line 10, with the following rewritten paragraph:

FIG. 6 is a bottom view of a three-color replaceable ink container 12 of the present invention shown in isolation. The replaceable ink container includes a pair of outwardly projecting guide rail engagement features 40. In the preferred embodiment, each of these guide rail engagement features 40 extend outwardly in a direction orthogonal to upright side 70 of the replaceable ink container 12. The engagement feature 42 extend outwardly from a front surface or leading edge 72 of the ink container 12. The engagement features 42 are disposed on either side of an electrical interface 74 and are disposed toward a bottom surface 76 of the replaceable ink container 12. The electrical interface 74, shown in Fig. 7, includes a plurality of electrical contacts 78, with each of the electrical contacts 78 electrically connected to an electrical storage device 80.

Please replace the paragraph beginning at page 10, line 20, with the following rewritten paragraph:

Once the ink container 12 is installed into the printing system 10 and fluidically coupled to the printhead by way of fluid interconnect 36, the capillary storage member 90 should allow ink to flow from the ink container 12 to the ink jet printhead 16. As the printhead 16 ejects ink, a negative gauge pressure, sometimes referred to as a backpressure, is created in the printhead 16. This negative gauge pressure within the printhead 16 should be sufficient to overcome the capillary force retaining ink within the capillary member 90, thereby allowing ink to flow from the ink container 12 into the printhead 16 until equilibrium is reached. Once equilibrium is reached and the gauge pressure within the printhead 16 is equal to the capillary force retaining ink within the ink container 12, ink no longer flows from the ink container to the printhead 16. The gauge pressure in the printhead 16 will generally depend on the rate of ink ejection from the printhead 16. As the printing rate or ink ejection rate increases, the gauge pressure within the printhead will become more negative, causing ink to flow at a higher rate to the printhead 16 from the ink container 12.

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Please replace the paragraph beginning at page 11, line 16, with the following rewritten paragraph:

A⁹ FIG. 7 is a perspective view of a monochrome or single color replaceable ink container 12 of the present invention. The monochrome ink container 12 is similar to the tri-color ink container 12 shown in FIG. 6 except that only a single ink color is contained therein instead of three separate ink colors contained with the tri-color ink container 12.

Please replace the paragraph beginning at page 11, line 20, with the following rewritten paragraph:

A¹⁰ FIG. 8 is a cross-sectional view taken along line 8-8 of FIG. 3, illustrating in further detail the ink container 12, comprising the reservoir portion or containment vessel 34, with the reservoir material 90 disposed therein. The ink container 12 is shown positioned for connection with the fluid interconnect 36 on the ink container receiving station 14 for illustrative purposes.

Please replace the paragraph beginning at page 12, line 1, with the following rewritten paragraph:

A¹¹ The ink container receiving station 14 also includes a sealing structure 96 to provide a seal between the ink container 12 and the receiving station 14. The sealing structure 96 tends to limit evaporation of volatile ink components such as water within the ink container 12 once the ink container 12 is properly installed into the receiving station 14. In addition, the sealing structure 96 tends to prevent contamination of the ink provided to the printhead 16. In one preferred embedment, the sealing structure 96 is a circumferential structure that is formed from a resilient material. As the ink container 12 is inserted into the receiving station 14, the sealing structure 96 engages a sealing surface 100 proximate the fluid outlet 88 of the ink container to form a seal between the sealing structure 96 and the ink container 12. The seal is established by a sealing surface 98 associated with the sealing structure 96 engaging the sealing surface 100 associated with the ink container 12.

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Please replace the paragraph beginning at page 13, line 3, with the following rewritten paragraph:

The sealing structure 96 in one exemplary embodiment is formed of a resilient material such as elastomeric structure such as Ethylene-Propylene-Diene monomer/butyl blend (EPDM/buty1). Alternatively, the sealing structure 96 includes a spring that is compressed as the ink container 12 is inserted into the receiving station 14 so that the spring urges the sealing structure 96 against the ink container 12 to establish a seal between the ink container 12 and the receiving station 14 to prevent evaporation of volatiles within the ink. An exemplary form of the sealing structure 96 with a spring is described in co-pending application serial number 09/651,682, filed August 30, 2000, LONG-LIFE SPRING-BACKED FLUID INTERCONNECT SEAL.

Please replace the paragraph beginning at page 13, line 28, with the following rewritten paragraph:

FIG. 10b is a cross-section taken across lines 10 b to show the sealing surface 98 of the sealing structure 96 shown partially broken away. In one preferred embodiment, the annular groove 102 is formed within the sealing surface 98 to retain the sealing material 104. Retaining sealing material 104 within the groove 102 ensures sealing material 104 is present to seal defects that exist along the entire continuum of the seal surface. Defects along the seal surface may be the result of molding defects that can produce irregularities in the seal surface, or contamination on the seal surface. By sealing defects with the sealing material 104 the seal between the sealing surface 98 and the sealing surface 100 is improved.

Please replace the paragraph beginning at page 14, line 27, with the following rewritten paragraph:

The present invention has been discussed with respect to the use of sealing material to improve the robustness of the seal between the ink container 12 and the receiving station 14. The technique of the present invention is suitable for sealing other fluid seals in the ink delivery system as well. For example, a similar seal arrangement can be used between the printhead 16 and the fluid interconnect 92 as the seal arrangement used between the ink